

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington D.C. 20554**

In the Matter of)	
)	
Request for Further Comment on Selected)	IB Docket No. 95-91
Issues Regarding Satellite Digital Audio)	RM No. 8610
Radio Service Terrestrial Repeater)	DA No. 01-2570
Networks)	

COMMENTS OF XM RADIO INC.

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Summary

XM Radio urges the Commission to conclude the DARS repeater rulemaking expeditiously and in a manner that is fair to the DARS licensees that have taken the risk of proceeding with system deployment. XM Radio and Sirius have taken those risks while enduring extraordinary delay in the regulatory process and untimely, speculative posturing by huge WCS companies that have been warehousing their spectrum and have no legitimate claims that they will suffer any interference that they cannot avoid by responsibly engineering their own systems. During many months of experiments and nearly two months of operation under its STA, XM Radio has yet to receive an interference complaint from a single WCS licensee. And, the WCS licensees' theoretical, worst-case analysis of interference from DARS repeaters has proven wrong in real-world testing. XM Radio remains committed to a compromise, but the compromise should be one that preserves the ability of DARS to provide a high-quality service.

With few exceptions, XM Radio generally supports the Commission's proposals for permanent rules for the operation of DARS terrestrial repeaters. The two principal clarifications or changes are (i) to define higher and lower power repeaters using the same averaging technique used for MDS and ITFS transmitters and (ii) to eliminate the proposed 18-month freeze on deployment of additional higher power repeaters.

By clarifying that repeaters should be defined by measuring their power over 360 degrees, the Commission would be adopting a rule that is fair and accurately reflects the more benign impact of directional antennas on the interference environment. Simply put, a typical XM repeater, with a 90 degree sectored antenna, operating at 6.3 kW EIRP, causes significantly less potential interference than a repeater with an omnidirectional antenna operating at 2 kW

EIRP. A rational rule should recognize this fact by averaging the power over the full 360 degrees and thereby encouraging the use of more spectrum efficient repeater design.

XM Radio strongly opposes any even temporary freeze on the deployment of repeaters that are available and can be deployed to improve service without causing any interference. As XM Radio optimizes its repeater networks, it plans to shift repeaters that are not needed in larger markets to smaller markets where they can be used to overcome building blockage. Overwhelmingly, there are no WCS facilities operating or even planned in these markets. Thus, a freeze will only hurt the quality of DARS without providing any protection for WCS licensees that they cannot achieve in other, far less onerous ways.

In addition, XM Radio urges the Commission to limit the DARS licensees' liability to WCS base stations and not consumer equipment, limit the compensation period to one year from the grant of the DARS STA (September 17, 2001), and limit the total liability of each DARS licensee for WCS claims at no more than \$10,000 per WCS base station site and \$1 million total.

XM Radio's acceptance of the FCC's proposed compromise represents a significant concession on its part considering that (i) WCS licensees have had notice since 1990 that DARS licensees were planning to operate higher power repeaters and failed to raise any objections until the last minute; (ii) with almost no exceptions, the WCS licensees are warehousing their spectrum and, thus, their interference concerns are entirely speculative; and (iii) WCS licensees can solve their own problem by eliminating their susceptibility to interference from DARS repeaters (as the DARS licensees have done to mitigate interference from one another) without adding significant cost and without detracting from the quality of what service they may eventually provide.

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COMMENTS OF XM RADIO INC.

XM Radio Inc. (“XM Radio”), holder of a license to operate a Digital Audio Radio Service (“DARS”) system in the 2332.5 – 2345 MHz band, hereby files these comments concerning the Commission’s Public Notice requesting further comment regarding satellite DARS terrestrial repeaters. With some exceptions noted below, XM Radio generally supports the Commission’s proposals in the Public Notice and urges the Commission to resolve this proceeding expeditiously and with fairness to the DARS licensees that have proceeded to develop and deploy their systems despite the uncertainty caused by a protracted Commission process.

Background

For the past six years, the Commission has been considering final rules that would govern the deployment and operation of the terrestrial repeaters. The Commission has sought public comment on DARS terrestrial repeaters and the rules for their operations in 1995,¹ June 1997,²

¹ See Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Notice of Proposed Rulemaking*, 11 FCC Rcd 1 (June 15, 1995) (comments due September 1995).

² See Report and Order, Memorandum Opinion and Order, and Further Notice of Proposed Rulemaking, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, 12 FCC Rcd 5754 (March 3, 1997) (“*DARS Order and FNPRM*”) (comments due June 1997).

January 1998,³ February 2000,⁴ August 2001 (in response to requests from the DARS licensees for Special Temporary Authority (“STA”) to operate repeaters),⁵ and now with respect to the newly-proposed rules.⁶

During all this time, the DARS licensees have always been candid and consistent in their plans for repeaters. Since the first DARS applicant proposed the use of repeaters in its 1990, the applicants and system operators have proposed power levels in excess of 2 kW EIRP and at least as high as 40 kW EIRP.⁷

Despite the lack of permanent rules for repeaters, the DARS licensees proceeded with their plans to construct and operate the first digital radio systems in America in order to comply with the Commission’s milestone deadline of October 2001 for launch of the first satellite. 47 C.F.R. § 25.144(b). In July 2001, with all authorized DARS satellites constructed and launched, the DARS licensees filed STA requests to operate their terrestrial repeaters for commercial

³ Public Notice, Report No. SPB-112 (December 23, 1997) (comments due January 1998).

⁴ Public Notice, IB Docket No. 95-91 (January 21, 2000) (comments due February 2000).

⁵ Request of XM Radio Inc. for Special Temporary Authority to Operate Digital Audio Radio Service Terrestrial Repeaters, FCC File No. SAT-STA-20010712-00063, Report No. SAT-00077 (July 31, 2001) (comments due August 21, 2001); Request of Sirius Satellite Radio Inc. for Special Temporary Authority to Operate Digital Audio Radio Service Terrestrial Repeaters, FCC File No. SAT-STA-20010724-00064, Report No. SAT-00077 (July 31, 2001) (comments due August 21, 2001).

⁶ “Request for Further Comment on Selected Issues Regarding the Authorization of Satellite Digital Audio Radio Service Terrestrial Repeater Networks,” *Public Notice*, Report No. SPB-176, IB Docket No. 95-91 (November 1, 2001).

⁷ See Application of Satellite CD Radio, Inc., File No. SAT-LOA-19900518-00037 (May 18, 1990); Letter from William Garner, American Mobile Radio Corporation, to Rosalee Chiara, FCC (filed Nov. 14, 1997); Letter from Robert D. Briskman, CD Radio, Inc. to Rosalee Chiara, FCC (filed Nov. 14, 1997); Supplemental Comments of XM Radio Inc. (filed Dec. 17, 1999); Supplemental Comments of Sirius (filed Jan. 8, 2000); Consolidated Reply of XM Radio Inc. (filed Mar. 8, 2000); Supplemental Reply Comments of Sirius (filed Mar. 8, 2000).

service pending the outcome of the repeater rulemaking.⁸ The sites listed in XM Radio's STA request represented the first phase of its repeater deployment, covering sixty cities.

All of the timely-raised concerns have been dealt with already. The DARS licensees have resolved the most problematic interference issues raised by repeaters, such as the potential for interference to the other DARS licensee, to flight test facilities, and to co-channel operations in Canada and Mexico.⁹ Terrestrial broadcasters have expressed concerns with competition from DARS, particularly if the repeaters are used to originate local programming and advertising. XM Radio has stated that it will not use its repeaters to originate local programming.¹⁰ Multipoint Distribution Service ("MDS") and Instructional Television Fixed Service ("ITFS") licensees expressed concern regarding potential interference to analog receivers that were inadvertently designed so as to be particularly vulnerable to interference from transmitters in the DARS band. The DARS licensees have proposed a rule by which they would accept some liability for compensating MDS/ITFS licensees for such interference.¹¹

⁸ XM Radio Inc., Request for STA, File No. SAT-STA-20010712-00063 (July 12, 2001) ("*XM STA Request*").

⁹ See Letter from Bruce D. Jacobs, Counsel for XM Radio, to Ronald Repasi, FCC, IB Docket No. 95-91 (Sept. 11, 2000) (providing coordination agreement between XM Radio and AFTRCC); News Release, "United States and Canada Agree on Conditions for Implementation of U.S. Digital Audio Radio Services (DARS)," Report No. IN 98-50 (Sept. 3, 1998); "Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Use of the 2310-2360 MHz band" (available at http://www.fcc.gov/ib/pndagreements/docs/dars_agrees/usmexdars.pdf).

¹⁰ *XM STA Request* at 2; see also XM Radio Inc., *Order and Authorization*, File No. SAT-STA-20010712-00063, ¶ 18 (Sept. 17, 2001) ("*STA Order*") ("SDARS repeaters are restricted to the simultaneous retransmission of the complete programming, and only that programming, transmitted by the satellite directly to SDARS subscriber's receivers.").

¹¹ Joint Letter from XM Radio and Sirius to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (Sept. 26, 2001) (proposed rule § 25.144(e)(3)(ii)).

The Commission granted its first licenses for the Wireless Communications Service in 1997.¹² Since then, there has been a widespread failure of the licensees to deploy any facilities.¹³ For several years, the WCS licensees also failed to participate in the DARS repeater rulemaking. Only in the past year have WCS licensees raised concerns regarding blanketing and intermodulation interference from repeaters operating above 2 kW EIRP. Throughout the past year, WCS licensees have made various claims regarding the expected sensitivity of their receivers and how DARS repeaters operating above 2 kW will interfere with these receivers. AT&T Wireless Services Inc. (“AWS”) has stated that the sensitivity threshold for its WCS base stations is -45 dBm¹⁴ and for its customer premises equipment is -58.6 dBm.¹⁵ BellSouth Corporation (“BellSouth”) has assumed that the sensitivity threshold for its WCS receiver will be

¹² See “FCC Announces the Grant of Wireless Communications Service Licenses,” *Public Notice*, 13 FCC Rcd 4782, DA 97-1552 (July 21, 1997).

¹³ The only two companies that have deployed WCS facilities in more than a couple of markets, Metricom and AWS, are either in bankruptcy and no longer operational or have announced plans to phase out their operations. See Letter from William Wiltshire, Counsel for AWS, to Ms. Magalie Roman Salas, FCC, IB Docket 95-91 (Oct. 29, 2001); Comments of Metricom Inc., Debtor-In-Possession, File No. SAT-STA-20010712-00063 (August 21, 2001). BellSouth and Verizon have consistently refused to coordinate specific facilities with XM Radio and have suggested in filings with the FCC that their plans for deployment are still in a state of flux. Comments of BellSouth Corporation, File No. SAT-STA-20010712-00063 (August 21, 2001), at 2 (noting that BellSouth is conducting trials of WCS technology); Letter from Karen B. Possner, Bell South, to Ms. Magalie Roman Salas, IB Docket No. 95-91 (May 18, 2001), at 5 (noting that “[b]ecause BellSouth has not yet chosen the applications it will provide over WCS or the technology it will employ, BellSouth cannot provide a specific analysis of the impact deployment of high-power SDARS terrestrial facilities will have.”). Verizon Wireless has stated that it plans to begin technical trials of WCS equipment in the first quarter of 2002. Reply Comments of Verizon Wireless, File No. SAT-STA-20010712-00063, 8 n.31 (August 30, 2001).

¹⁴ Comments of AT&T Wireless Services Inc., File No. SAT-STA-20010712-00063, at 8 (August 21, 2001).

¹⁵ Letter from William M. Wiltshire, Counsel for AT&T Wireless, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (April 30, 2001), at 5.

-35 dBm (which is actually -58 dBm when the antenna gain is added).¹⁶ WorldCom Inc. (“WorldCom”) has stated that the sensitivity threshold for both its WCS hub receivers and customer premises equipment is -51 dBmW.¹⁷ Metricom Inc. (“Metricom”) has stated that the sensitivity threshold for its WCS receiver is -32 dBm at the antenna.¹⁸ Verizon Wireless has stated that the sensitivity threshold for its CPE is -31 dBm.¹⁹

In September 2001, the Commission granted the DARS Licensees’ STA requests, noting that the DARS licensees have proceeded with the construction of their systems in compliance with the Commission’s milestone requirements and that it would be unfair to penalize the DARS licensees by delaying initiation of service because there were no final repeater rules.²⁰ As with all STAs, the International Bureau required the DARS licensees to operate on a non-interference basis, requiring them to cease operating a repeater upon receiving an interference complaint.

In the course of responding to the concerns of WCS licensees, XM Radio has provided technical evidence that:

- the potential for interference to WCS receivers is reduced by XM Radio’s use of a repeater network design that emphasizes fewer higher power repeaters instead of more lower power repeaters.²¹

¹⁶ Comments of BellSouth, File No. SAT-STA-20010712-00063, at Attachment A (August 21, 2001).

¹⁷ Comments of WorldCom Inc., File No. SAT-STA-20010712-00063, at Exhibit 1 (August 21, 2001).

¹⁸ Comments of Metricom Inc., Debtor-In-Possession, File No. SAT-STA-20010712-00063, at Exhibit A (August 21, 2001).

¹⁹ Reply Comments of Verizon Wireless, File No. SAT-STA-20010712-00063, Appendix at 3 (August 30, 2001).

²⁰ XM Radio Inc., *Order and Authorization*, File No. SAT-STA-20010712-00063 (Sept. 17, 2001) (“*XM STA Order*”); Sirius Satellite Radio Inc., *Order and Authorization*, File No. SAT-STA-20010712-00063 (Sept. 17, 2001) (“*Sirius STA Order*”).

²¹ See Letter from Bruce D. Jacobs, Counsel for XM Radio Inc., to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (August 29, 2001) (“*XM White Paper*”), at 15-20;

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- the use of sectorized rather than directional antennas greatly reduces the potential for interference to WCS receivers.²²
- the susceptibility of the WCS receiver to blanketing or intermodulation interference can be improved substantially, without adding significant cost and without detracting from quality of service, through basic receiver design or through the use of in-line filters for WCS base stations and RF AGC for WCS customer premises equipment (“CPE”).²³
- WCS licensees that have not yet deployed their facilities will be able to substantially reduce their susceptibility to interference by designing their networks with DARS higher-power repeater sites in mind and higher WCS base station power in some cases can improve the interference environment.²⁴

Since grant of the STA requests in September, XM Radio has been operating several hundred repeaters nationwide and has not received any complaints from WCS or MDS/ITFS licensees. In fact, while AWS and Worldcom had previously provided the Commission with theoretical, worst-case analyses purporting to demonstrate that XM Radio’s repeaters would cause interference to actual operating WCS facilities in Houston and Memphis,²⁵ subsequent discussions and joint testing between the parties have revealed that no such interference exists.²⁶ For example, XM Radio’s joint testing with AWS in Houston has revealed that an XM Radio

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Letter from Lon C. Levin, XM Radio Inc., to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (September 14, 2001) (“*XM White Paper Supplement*”), at 17-18.

²² *XM White Paper* at 10-15.

²³ *XM White Paper* at 1-7; *XM White Paper Supplement* at 2-13.

²⁴ *XM White Paper* at 7-10.

²⁵ Comments of AT&T Wireless Services Inc., File No. SAT-STA-20010712-00063 (August 21, 2001); Comments of WorldCom Inc., File No. SAT-STA-20010712-00063 (August 21, 2001).

²⁶ *See* Exhibit A; Exhibit B (Declaration of Phillip Barsky, XM Radio).

higher power repeater across the street from AWS CPE and 350 feet from an AWS base station did not cause interference. *See Exhibit A.*

XM Radio continues to deploy its repeaters and make adjustments to its repeater network, including in some cases eliminating repeaters that have proven unnecessary. XM Radio has an inventory of approximately 1453 transmitters with lower-power amplifiers (200 watts) and only 125 transmitters with higher-power amplifiers (2000 watts). These transmitters are the result of a procurement process that XM Radio began in 1997 as part of its effort to timely deploy its repeater network and comply with its system milestones. XM Radio's current expectation is that it will fully deploy those repeaters over the ensuing two years, before ordering and deploying additional repeaters.

With the above Public Notice, the Commission seeks comment on the operation of terrestrial repeaters for the sixth time since 1995.²⁷ The Commission proposes to allow DARS licensees to operate an unlimited number of what it calls "low power" repeaters without prior coordination with other licensees. For what it calls "high power" repeaters, the Commission proposes to freeze any deployment beyond what was authorized in September 2001 in the STA, for eighteen months after the effective date of final rules. During this eighteen-month period, the Commission proposes to require DARS licensees to compensate WCS licensees for interference to WCS stations outside of a safe-harbor zone.

Discussion

XM Radio supports the Commission's general proposal. There are two particularly critical changes, however. The first change is that the line between "high power" and "low

²⁷ "Request for Further Comment on Selected Issues Regarding the Authorization of Satellite Digital Audio Radio Service Terrestrial Repeater Networks," *Public Notice*, Report No. SPB-176, IB Docket No. 95-91 (November 1, 2001).

power” repeaters should be calculated by averaging the transmitter’s power over a full 360 degrees. This is the approach taken to measuring MDS and ITFS transmitter power and it more fairly takes into account the actual interference potential of a repeater. A repeater with a directional antenna operating at 2 kW EIRP averaged over 360 degrees will always have less potential for interference than a repeater with an omnidirectional antenna operating at 2 kW EIRP. With this measurement technique, XM Radio is willing to agree to a power cap of 18 kW EIRP for both existing and future higher power terrestrial repeaters. The second change is that there must be no freeze on deployment of XM Radio’s existing stock of repeaters. Such a freeze would only harm consumers without any benefit to WCS licensees or others.

Other important elements of any rules should include the following: (i) DARS licensees should be required to resolve interference only to WCS base stations and not customer premises equipment (“CPE”); (ii) WCS licensees should be limited to the WCS receiver sensitivities they have previously disclosed to the Commission; (iii) the compensation period should last for no more than one year from when the STA was granted (*i.e.*, terminating on September 17, 2002); (iv) as proposed by the Commission, the obligation of a DARS licensee to compensate a WCS licensee should only be triggered if a DARS repeater causes a WCS base station to be unable to provide commercial service; and (v) a DARS licensee’s liability to all WCS licensee for filters should be limited to no more than \$10,000 per base station site and \$1 million total.

I. WITH SOME EXCEPTIONS, XM RADIO SUPPORTS THE COMMISSION’S PROPOSED DEFINITIONS AND BASIC REQUIREMENTS FOR REPEATERS

A. The Rules Should Provide for Repeaters To Be Categorized Based on Their Power As Measured Over 360 Degrees

XM Radio supports the Commission’s proposal to treat repeaters that transmit at more than 2 kW EIRP differently than those transmitting at lower power. Such an approach is

consistent with what the DARS licensees have proposed in the past.²⁸ It should be noted, however, that the term “high power” is inaccurate. Repeaters operating at power levels up to 40 kW EIRP should not be considered “high” for a broadcast service such as DARS. Unlike a two-way service such as that proposed by WCS licensees, for a single frequency broadcast network, such as that used by XM Radio, power levels of up to 40 kW EIRP are typical, particularly given the higher part of the frequency range in which they operate.²⁹ Thus, it is more appropriate to define the two categories as “higher power” (HPR) and “lower power” (LPR) repeaters.

While XM Radio generally supports the Commission’s proposal to require DARS licensees to compensate WCS licensees in certain instances based upon whether a repeater is an HPR or an LPR, XM Radio can only support this regulatory scheme if power is calculated by averaging the power over 360 degrees.³⁰ With this measurement technique, XM Radio’s repeaters will never exceed 18 kW EIRP.

²⁸ See, e.g., Letter from Carl R. Frank, Counsel for Sirius, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (January 25, 2001) (proposing rule for the operation of terrestrial repeaters); Letter from Carl R. Frank, Counsel for Sirius, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (April 23, 2001) (proposing rule for the operation of terrestrial repeaters); Letter from Bruce D. Jacobs, Counsel for XM Radio, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (April 25, 2001) (proposing rule for the operation of terrestrial repeaters); Joint Letter from Sirius and XM Radio to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (September 26, 2001) (proposing rule for the operation of terrestrial repeaters).

²⁹ As XM Radio has explained before, HPRs reduce the complexity and cost of the repeater network in a city. A single higher-power repeater can replace many lower-power repeaters. This simplicity is particularly important in a single frequency broadcast network, since all of the repeaters in a given area must be precisely timed and coordinated with one another in order to provide reliable, high-quality service. The higher-power repeaters effectively become a keystone for managing the synchronization of the overall repeater network in a city. This is unlike a cellular system in which each transmitter acts independently of one another and precise timing considerations are not a concern. See Letter from Lon C. Levin, XM Radio, to Donald Abelson and Tom Sugrue, FCC (August 7, 2001).

³⁰ XM supports the following definition for a “lower power” repeater:

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The Commission has adopted this measurement technique for MDS and ITFS licensees.³¹

It more accurately describes the interference environment created by the operation of XM Radio's repeaters. Most of XM Radio's repeaters use sectorized antennas that focus energy in a narrow beamwidth. Outside of this narrow beamwidth, there is no potential for interference to WCS operations. As XM Radio described in its August 2001 White Paper, for a given WCS receiver blanketing interference threshold, the same amount of conducted power applied to a sectorized antenna will result in a smaller exclusion zone when compared to an omnidirectional

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“Lower power. The term “lower power” means an average EIRP not exceeding 2 kW (33 dBW). If the transmitters operated by a satellite DARS licensee at a given site use one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern, the maximum cumulative EIRP of the transmitting antennas in a given direction shall be determined by the following formula:

$$\text{EIRP} = 33 \text{ dBW} + 10 \log(360/\text{beamwidth}) \text{ dBW}, \text{ where } 10\log(360/\text{beamwidth}) \text{ is less than or equal to } 6 \text{ dB}$$

Beamwidth is the total horizontal plane beamwidth of the individual transmitting antenna for the repeater or any sector measured at the half-power points.”

XM supports the following definition for a “higher power” repeater:

“Higher power. The term “higher power” means an average EIRP greater than 2 kW but not exceeding 18 kW (42.6 dBW). If the transmitters operated by a satellite DARS licensee at a given site use one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern, the maximum cumulative EIRP of the transmitting antennas in a given direction shall be determined by the following formula:

$$\text{EIRP} = 42.6 \text{ dBW} + 10 \log(360/\text{beamwidth}) \text{ dBW}, \text{ where } 10\log(360/\text{beamwidth}) \text{ is less than or equal to } 3 \text{ dB}.”$$

³¹ 47 C.F.R. §§ 21.904(a), 74.935(a).

antenna.³² XM Radio has demonstrated that antenna gain, when averaged over 360 degrees in azimuth, is lower for a sectorized antenna than an omnidirectional antenna.

In its August 2001 White Paper, XM Radio provided the following graphical demonstration of this fundamental principle³³:

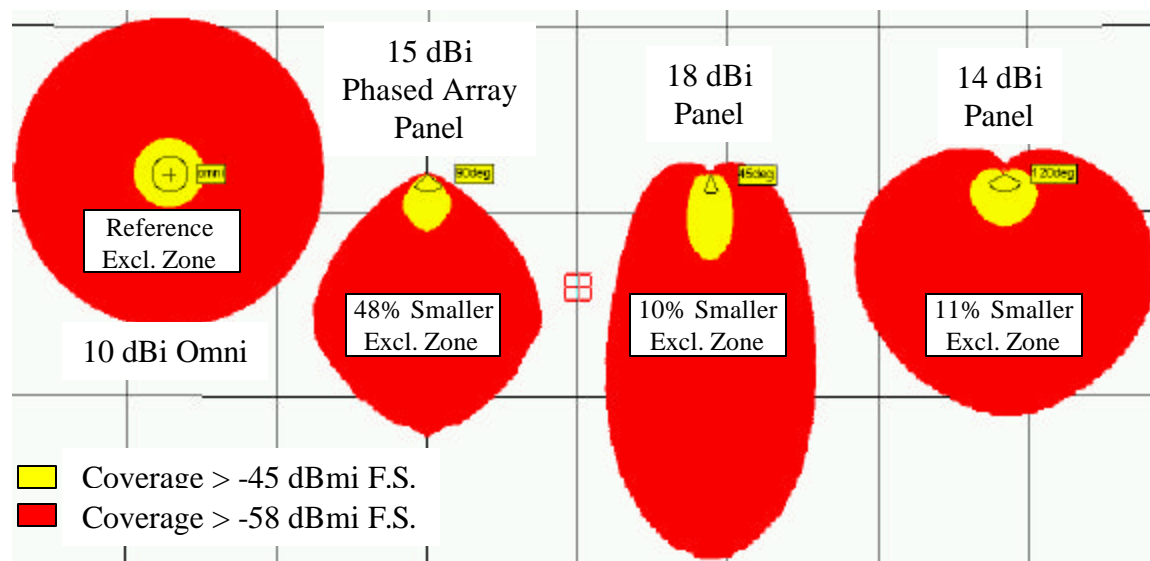


Figure 16. Line of Sight Exclusion Zones for Omni Vs. Panel Antennas

RF Power at Ant. Feed (Watts)	Antenna	Peak EIRP (Watts)	-45 dBm Excl. Zone (Sq. Miles)	-58 dBm Excl. Zone (Sq. Miles)	Excl. Zone Reduction (percent)
200	10 dBi Omni	2 000	8.0	158	0
200	15 dBi PA Panel	6 325	4.2	82	48
200	18 dBi Panel	12 619	7.2	142	10
200	14 dBi Panel	5 024	7.1	141	11

Table 3. Peak EIRP and Exclusion Zones for Omni and Panel Antennas

³² XM White Paper at 10-15.

³³ XM White Paper at 15.

Thus, calculating power levels by averaging the power of a repeater over 360 degrees more accurately describes the true impact on the interference environment. Virtually all of the XM Radio repeaters that use the 200W (lower power) amplifiers would thus qualify as LPRs.

B. XM Radio Supports the Commission's Proposal Regarding Authorized Transmissions

XM Radio supports the Commission's proposal to limit transmissions from repeaters to only that programming that is transmitted by an authorized DARS satellite and to require that the satellite and repeater signal are received nearly simultaneously by subscribers. XM Radio continues to support this concept, as it has throughout the DARS rulemaking proceeding.³⁴ Adoption of this proposal should appease the concerns of the terrestrial broadcast industry that DARS licensees seek to use repeaters to originate locate programming and create independent terrestrial radio networks.

C. XM Radio Supports the Proposed Eligibility Rules

XM Radio supports the proposed rule that authority to operate repeaters should be granted only to DARS licensees with operational space stations. Public Notice at 3 (§ I.C).

D. The Commission's Proposed Frequencies for Operation of Repeaters Must Be Modified

The proposal to limit the edge of the repeater band to no less than 4.0 MHz from the edge of the DARS band needs to be modified slightly to reflect the fact that XM Radio operates its repeaters slightly closer (3.715 MHz) to the upper band edge. This represents the upper extreme of the ninety-nine percent bandwidth point of the repeater's transmitted signal. This is consistent

³⁴ See, e.g., Reply Comments of XM Radio Inc., IB Docket No. 95-91 (Jan. 22, 1998), at 2-3; Supplemental Comments of XM Radio Inc., IB Docket No. 95-91 (Dec. 17, 1999), at 5; Letter from Bruce D. Jacobs, Counsel for XM Radio, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (April 25, 2001) (proposed rule section 25.144(e)(1)).

with what XM Radio has always told the Commission and with the U.S-Mexico coordination agreement.³⁵ The rule proposed by one of the WCS licensees also acknowledges the actual frequencies used by XM Radio's repeaters.³⁶

E. The Commission's Proposed Out-of-Band Emission Limits Should Be Modified Slightly

The Commission proposes two emissions limits on DARS repeaters, an out-of-band limit to protect WCS licensees and an in-band limit to protect the other DARS licensee. Public Notice at 3 (§ I.D). The Commission's proposed in-band limit is less stringent than its proposed out-of-band limit. XM Radio believes both limits should be the same. XM Radio and Sirius have already privately negotiated a much more stringent in-band limit of $75 + 10\log(P)$, which WCS licensees have said is also a sufficient out-of-band limit to protect their operations.³⁷

Accordingly, XM Radio proposes the following out-of-band emissions limits:

- For the DARS licensee operating in the 2320 and 2332.5MHz band (Sirius):

Below 2320 MHz and above 2332.5 MHz, the peak equivalent isotropically radiated power ($P_{e\text{irp}}$) from any SDARS repeater operating within its assigned frequency band between 2320 and 2332.5MHz shall be attenuated by a factor (P_e) at least equal to $75 + 10 \log (P_{e\text{irp}})$ db

³⁵ "Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Use of the 2310-2360 MHz band" (available at http://www.fcc.gov/ib/pndagreements/docs/dars_agrees/usmexdars.pdf).

³⁶ Letter from William M. Wiltshire, Counsel for AT&T Wireless, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (April 30, 2001).

³⁷ *See, e.g.*, Letter from William M. Wiltshire, Counsel for AT&T Wireless, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (April 30, 2001), at 2, 8; Letter from Karen B. Possner, Bell South, to Ms. Magalie Roman Salas, IB Docket No. 95-91 (May 18, 2001), at 3.

- For the DARS licensee operating in the 2332.5 and 2345 MHz band (XM Radio):

Below 2332.5 MHz and above 2345 MHz, the peak equivalent isotropically radiated power (P_{eirp}) from any SDARS repeater operating within its assigned frequency band between 2332.5 and 2345MHz shall be attenuated by a factor (P_e) at least equal to $75 + 10 \log (P_{\text{eirp}})$ db.

XM Radio supports the Commission's proposed measurement technique for calculating compliance with the emission limits.

F. XM Radio Supports Prior Approval for Certain Repeaters

XM Radio supports the Commission's proposal to require prior approval for certain repeaters. Public Notice at 3 (§ II). DARS licensees have supported such prior approval for many years.³⁸

G. XM Radio Supports the Proposed RF Safety Rules

XM Radio supports the Commission's proposed rule to require DARS licensees to perform routine environmental evaluations if a repeater's EIRP exceeds 2000 Watts. Public Notice at 8 (§ VI).

II. XM RADIO SUPPORTS THE COMMISSION'S PROPOSALS REGARDING LOWER POWER REPEATERS

XM Radio supports the Commission's proposal to allow DARS licensees to operate an unlimited number of LPRs without prior coordination with other licensees. Public Notice at 4 (§ III.A). This is the same rule pursuant to which WCS licensees operate their transmitters. In addition, as the International Bureau has recognized, AWS and other WCS licensees have

³⁸ See *DARS Order and FNPRM* at Appendix C (requesting comments on Sirius' proposed rule for repeaters).

conceded the operation of repeaters at up to 2 kW EIRP and have stated that such repeaters do not present an interference concern.³⁹

Subject to certain clarifications discussed below, XM Radio does not oppose the Commission's proposal to require DARS licensees to provide notice and technical parameters to WCS, MDS, and ITFS licensees at least 30 days prior to commencing operations from any new LPR, or with increased power from any existing LPR up to 2 kW EIRP, in the licensed service area of the WCS, MDS, or ITFS licensee. Public Notice at 4 (§ III.B). XM Radio does not object to this proposal if the final rules reflect certain clarifications. First, the final rules should reflect that the purpose of the notification requirement is solely to provide notice and is not to provide WCS, MDS, or ITFS licensees with an opportunity to file an objection with the Commission prior to the operation of an LPR. Second, the Commission should allow for a waiver of the 30-day prior notification requirement in unusual cases where an LPR must be deployed on short notice. This would be rare, but it might occur if a new building or radio facility causes unanticipated blockage that can be corrected quickly by installing an LPR, thus restoring high quality service to the public. Third, DARS licensees should be required to provide notice to only those WCS, MDS, and ITFS licensees that are actually operating facilities for

³⁹ STA Order at ¶ 9 (“We agree with XM that because the focus of the party’s technical interference objections has been on repeaters operating above 2 kW EIRP and because the particulars of those stations have been disclosed, Section 25.120’s requirements for specificity have been satisfied.”); *see also* Comments of AT&T Wireless Services, Inc., File No. SAT-STA-20010712-00063 (August 21, 2001) at 4 (noting that AT&T Wireless and other WCS licensees have proposed blanket licensing of 2 kW DARS repeaters); Comments of Metricom, File No. SAT-STA-20010712-00063 (August 21, 2001) at 8 (“Metricom’s system can accommodate the operations of SDARS terrestrial repeaters at power levels at or below 2 kW EIRP”); Comments of Wireless Communications Association International, Inc., File No. SAT-STA-20010712-00063 (August 21, 2001) at 5-6; Opposition of Worldcom, Inc., File No. SAT-STA-20010712-00063 (August 21, 2001) at 2).

commercial service in their licensed service area. DARS licensees should not be responsible for ascertaining which WCS, MDS, and ITFS licensees are operational in their licensed service area. Rather, the Commission should require WCS, MDS, and ITFS licensees that want to receive notification prior to the operation of an LPR to file a certification with the Commission that is served on DARS licensees listing the markets in which they are operating facilities and they should be required to update this list periodically. Finally, the Commission should impose the same kind of notice obligation on WCS, MDS, and ITFS licensees that is proposed for DARS licensees, and require any licensee that requests notice from a DARS licensee to provide that DARS licensees with 30-days notice prior to operating a new station of its own.

III. THE COMMISSION'S PROPOSAL FOR OPERATION OF HIGHER POWER REPEATERS OVER THE NEXT EIGHTEEN MONTHS SHOULD BE MODIFIED IN PART

A. The Commission Should Not Impose a Freeze on Deployment of New HPRs

The Commission proposes that a freeze be imposed on DARS licensees' HPR deployment for eighteen months after the effective date of final rules, limiting operation of HPRs to those repeaters listed in the DARS licensees' July 2001 STA requests. Public Notice at 5 (§ IV.A). XM Radio opposes this proposal in the strongest possible terms because it will serve no apparent purpose other than to punish DARS licensees and their consumers by impeding the ability of DARS licensees to provide high quality service.

XM Radio's STA request filed in July 2001 reflected its best guess at that time, albeit based on extensive testing and modeling, for the optimum repeater network in sixty initial cities. With the benefit of real world experience operating these repeaters for commercial service, XM Radio is in the process of refining its repeater deployment in these cities. This may entail increasing or decreasing the power of a repeater, eliminating or adding HPRs, or changing the

location of an HPR. Thus, in order to further optimize its repeater network for the benefit of its listeners, XM Radio will need the flexibility to change the location and technical parameters of its existing HPRs. An eighteen-month freeze on HPRs will not enable XM Radio to make these improvements in service.

Moreover, XM Radio's July 2001 STA request reflects only the first sixty cities in which it had done extensive planning to deploy repeaters. Additional cities such as Des Moines, Iowa and Tallahassee, Florida, which are not covered by XM Radio's STA request, deserve the benefits of high-quality DARS as much as other cities. In its first two months of providing commercial service, XM Radio has identified as unnecessary certain of the repeaters in some of the initial sixty markets listed in its STA request. XM Radio needs the flexibility to relocate those repeaters to new sites and new cities.

The Commission should not fear that XM Radio's repeater deployment in additional cities will be excessive, since XM Radio has only a limited inventory of repeater amplifiers and does not have any immediate plans to purchase additional HPRs. XM Radio took a risk in contracting for this equipment in 1997 in order to have its repeater network in place in time for the launch of its satellites. The Commission's milestone required XM Radio to launch one satellite by October 2001, which effectively amounted to a requirement that XM Radio begin commercial service close to that date, as XM Radio could not simply spend hundreds of millions of dollars to launch one satellite and let its investment sit idle. To begin commercial service providing the kind of high-quality audio that would attract customers, XM Radio needed to launch both satellites and deploy the urban repeater networks that the Commission had recognized were important parts of a satellite DARS system. Taking the risk to contract for higher power repeater amplifiers was entirely reasonable given the lack of opposition on the

record to HPRs. If there is a freeze, XM Radio would be left with up to \$60 million in repeater equipment in its inventory.

To prevent XM Radio from using this equipment would be grossly unfair, particularly considering that WCS licensees are not even using their spectrum. A freeze will do nothing to benefit WCS licensees. WCS licensees have held their licenses since 1997 and, for the most part, have still not deployed facilities. AWS, for example, began to deploy WCS facilities, but has now abandoned its operations⁴⁰ and Metricom struggles to emerge from bankruptcy.⁴¹ There is little reason to believe that WCS licensees will deploy facilities in the next eighteen months, particularly not in the smaller urban areas where the additional repeaters are likely to be deployed. Thus, a freeze will do nothing but limit the flexibility of DARS repeater deployment with no benefit in return.

Imposing a freeze on repeater deployment now could not come at a worse stage in the development of the DARS. The next eighteen months are a critical time in the development of the DARS industry, for this is the period during which consumers will form their first impressions of DARS. If DARS licensees cannot offer the highest-quality service now, the image of DARS will be permanently damaged and the Commission's goal to bring nationwide, digital radio to the American public will go unfulfilled.

B. XM Radio Supports the Commission's Proposed Safe Harbor and Liability Zone Concepts

XM Radio generally supports the Commission's "Safe Harbor" and "Liability Zone" concepts, with certain important exceptions. Public Notice at 5 (§ IV.B). As proposed by the

⁴⁰ See Letter from William Wiltshire, Counsel for AWS, to Ms. Magalie Roman Salas, FCC, IB Docket 95-91 (Oct. 29, 2001).

Commission, a DARS licensee would not be required to coordinate with WCS stations located within the theoretical interference zone of a repeater operating at 2 kW EIRP using an omnidirectional antenna. DARS licensees would be required to coordinate with WCS licensees with respect to WCS stations located outside of the Safe Harbor but within a Liability Zone, the outer edge of which is the edge of the theoretical interference zone generated by the actual HPR. The power level contours in both cases would be calculated using free space loss and the threshold sensitivity characteristics of the receivers deployed by the affected WCS licensee. The Commission proposes a compensation regime pursuant to which if a DARS licensee is notified by an affected WCS licensee that it is receiving blanketing interference within the Liability Zone that “prevents the provision of commercial service,” the SDARS licensee must pay the reasonable costs of eliminating or mitigating such interference. Public Notice at 6 (§ IV.E). For six months after the effective date of final rules, the Commission proposes that DARS licensees would be liable for 100% of such costs; for the next six months, DARS licensees would be liable for 50% of such cost; and for the next six months, DARS licensees would be liable for 25% of such costs. Eighteen months after the effective date of final rules, the Commission proposes that DARS licensees would have no financial obligation to mitigate interference to WCS licensees. The Commission proposes to limit the liability to base station equipment costs, but it asks whether other costs should be included and other equipment, such as consumer receivers.

XM Radio is willing to accept this regulatory regime with certain clarifications. XM Radio’s acceptance of this compromise solution represents a significant concession on its part. For many reasons, the Commission should have already adopted rules authorizing DARS

Footnote continued from previous page

⁴¹ See Comments of Metricom Inc., Debtor-In-Possession, File No. SAT-STA-20010712-
Footnote continued on next page

licensees to operate repeaters at power levels up to 40 kW without a coordination or compensation requirement. WCS licensees have been on notice since 1990 that DARS licensees were planning to operate higher power repeaters and could have designed equipment with this in mind or raised their issues much earlier. The concerns that they now raise are woefully untimely and remain completely speculative. WCS licensees have been warehousing their spectrum for years and any true deployment appears to remain sufficiently distant as to permit the design of receivers that will not be vulnerable to interference from DARS repeaters. XM Radio has provided exhaustive technical analysis explaining that the susceptibility of the WCS receiver to blanketing or intermodulation interference can be improved substantially, without adding significant cost and without detracting from quality of service, as the DARS licensees have done to mitigate interference from one another.

XM urges the Commission to adopt the following clarifications:

First and most significantly, the definition of HPRs should be clarified to reflect that power will be measured over 360 degrees. As discussed above, the only fair and proper way to define HPRs for purposes of calculating their interference is to measure their power over 360 degrees. Using such a measurement technique also significantly reduces XM Radio's potential liability to WCS licensees. Using this measurement technique, XM Radio's repeaters will never exceed 18 kW EIRP. If the Commission is unwilling to adopt this measurement technique here, then fairness requires the DARS licensees' liability to be reduced in other ways. There are any number of reasonable alternatives for doing so, including shortening the period of exposure to claims of WCS licensees, limiting the total dollar amount of the exposure, or requiring WCS

Footnote continued from previous page

00063 (August 21, 2001).

licensees to build receivers that meet reasonable standards for vulnerability to overload and intermodulation.

Second, DARS licensees should only be required to resolve interference to WCS base stations and not customer premises equipment (“CPE”). It would be unfair to expose DARS licensees to the open-ended potential liability of resolving interference to CPE.

Third, the Commission should limit the overload threshold WCS licensees can claim in calculating the Safe Harbor and Liability Zone to those receiver sensitivity thresholds for base stations they have previously claimed to be applicable to their development efforts. *See supra* notes 13-18. The WCS licensees should be held accountable for the claims they have been making to the Commission in this proceeding. For example, in calculating the Safe Harbor, WCS licensees should not be able to specify a receiver overload sensitivity threshold that demonstrates less susceptibility to interference from repeaters than they have previously stated. In addition, the Commission should not allow the receiver sensitivities of WCS base stations to fluctuate. If the Commission allows for fluctuation, the Commission would be inviting WCS licensees to alter their receiver sensitivity numbers in order to minimize the Safe Harbor in some cases or to maximize the Liability Zone in other cases. In addition, the Commission should require WCS licensees to submit their base station receivers to independent third party testing to verify that their receiver sensitivity figures are accurate.

Fourth, the Commission should clarify the meaning of the phrase “prevents the provision of commercial service” which it proposes as the standard to trigger the obligation of DARS licensees to compensate WCS licensees. XM Radio supports the Commission’s intent to require that interference from a DARS repeater prevent a WCS licensee from serving actual customers, rather than basing compensation on interference to theoretical customers using theoretical

receivers. WCS licensees should be prevented from seeking compensation for any facilities that are not operational and that were not disclosed to DARS licensees before the deployment of a given repeater.

Fifth, the period during which DARS licensees are required to compensate WCS licensees should be reduced to one year from when the DARS Licensee's STAs were granted (*i.e.*, September 17, 2001). A one-year period for resolving blanketing interference is standard, as the AM, FM, and public mobile service blanketing interference rules all require new stations to resolve complaints of blanketing interference within one year after commencing operations. 47 C.F.R. §§ 73.88, 73.318, 22.353. In addition, XM Radio also urges the Commission to adopt the following compensation schedule:

- Prior to January 1, 2002, DARS licensees would be liable for 100 percent of the cost of filters to remedy interference at an operating WCS base station site caused by higher power repeaters.
- From January 1, 2002 until March 17, 2002, DARS licensees would be liable for 50 percent of the cost of filters to remedy interference at an operating WCS base station site caused by higher power repeaters
- From March 17, 2002 until September 17, 2002, DARS licensees would not be responsible for remedying any interference to an operating WCS base station site caused by higher power repeaters that were identified in the July 2001 STA requests. DARS licensees, however, would be liable for 100 percent of the cost of filters to remedy interference at an operating WCS base station site caused by new higher power repeaters (*i.e.*, one not identified in the July 2001 STA request).

This compensation scheme reflects that WCS licensees have had more than sufficient notice of DARS repeater deployment plans and have ample opportunity to address any interference concerns through placement of base stations and properly designing equipment.

Sixth, the Commission should cap the total dollar amount a DARS licensee can owe

WCS licensees for filters to \$1 million in the aggregate and the total amount for which a DARS licensee can be liable for filters per base station site to \$10,000. The Commission also asks whether DARS licensees should be required to pay all costs associated with eliminating interference, including labor costs, or whether they should be required to pay only for filters for WCS base stations. Public Notice at 6 (§ IV.E). DARS licensees should be required to pay only for filters for WCS base stations, and not for labor or any additional costs associated with interference mitigation. It has been amply demonstrated that WCS licensees can build facilities and equipment that is not susceptible to the kind of potential interference generated by repeaters, as the DARS licensees themselves have done to protect their operations from each other. In the meantime, XM Radio is willing to assist in solving any short-term problems that its repeaters may cause, but fairness requires its burden to be limited to a reasonable level.

The proposed Safe Harbor/Liability Zone regime, modified by these conditions, will provide adequate compensation to WCS licensees while at the same time ensuring the Commission's goal to bring digital radio to all Americans is not thwarted by excessive payments from DARS licensees to WCS licensees.

IV. A POWER CAP AND PRIOR NOTIFICATION CONDITION ARE SUFFICIENT FOR FUTURE HPRS TO PROTECT WCS

The Commission offers two proposals for regulating HPRs after the compensation period ends. Public Notice at 7 (§ V). Under the first alternative, existing HPRs would be grandfathered, a power cap would be applied to future HPRs, and DARS licensees would be required to provide 90-days notice to WCS licensees prior to commencing operations from a new HPR. Under the second proposal, DARS licensees would be able to operate HPRs at power levels up to 40 kW EIRP only after reaching a prior coordination agreement for the repeater with affected WCS licensees.

XM Radio supports the first proposal with some clarifications. First, the Commission should establish a power cap of 18 kW EIRP, assuming that power is calculated by averaging over a full 360 degrees. If the Commission does not adopt this measurement technique, then XM Radio urges the Commission to grandfather all HPRs operating at the end of the compensation period (and replacements for those repeaters) and to apply any power cap only to future HPRs. Second, DARS licensees should be required to give WCS licensees no more than 30-days notice prior to commencing operation of a new HPR. A 30-day notice period, not the 90-day notice period proposed by the Commission, will be sufficient to protect WCS licensees, without unduly hampering timely repeater deployment. In addition, the final rules should provide for the following: (i) the purpose of the notification requirement is solely to provide notice and is not to provide WCS licensees with an opportunity to file an objection with the Commission prior to the operation of an HPR; (ii) DARS licensees should be required to provide notice only to those WCS licensees that are actually operating facilities for commercial service and, accordingly, WCS licensees who want to receive notification prior to the operation of an HPR should be required to file a certification with the Commission that is served on DARS licensees listing the markets in which they are operating facilities and to update this list periodically; (iii) the Commission should impose a reciprocal obligation on WCS licensees and require them to provide DARS licensees with 30-days notice prior to operating a new station; and (iv) allow for a waiver of the 30-day prior notification requirement in unusual cases where an HPR must be deployed on short notice.

XM Radio does not support the alternative of requiring prior coordination of new repeaters. Such an approach would lead to substantial delay in the deployment of new repeaters as DARS licensees try to coordinate with WCS licensees that have no incentive to coordinate in

the first instance. The power cap/prior notification proposal, however, provides certainty for DARS licensees regarding the additional repeaters they can deploy and provides WCS licensees with a concrete power limit, far below the 40 kW limit DARS licensees have proposed in the past, to define the interference environment from DARS repeaters.

V. THE COMMISSION’S PROPOSALS FOR PROTECTION OF MDS/ITFS SHOULD BE MODIFIED

The Commission also proposes a number of rules to protect MDS/ITFS licensees from DARS repeaters. For all LPRs, whether deployed before, during, or after the HPR “freeze,” the Commission proposes to require DARS licensees to provide MDS/ITFS licensees with 30-days notice prior to commencing operations from any new LPR, or with increased power from any existing LPR up to 2 kW EIRP, in the licensed service area of the MDS/ITFS licensee. Public Notice at 4 (§III.A). For LPRs and HPRs operating during the HPR “freeze,” the Commission also proposes to require DARS licensees to comply with same rule as WCS licensees for compensation of MDS/ITFS licensees for blanketing interference to old analog block downconverters. Public Notice at 4, 7 (§§ III.C, IV.F) (citing 47 C.F.R. § 27.58). For HPRs deployed after the “freeze,” the Commission proposes to require DARS licensees to provide notice to MDS/ITFS licensees at least 90 days prior to commencing operations from any new HPR. Public Notice at 7 (§ V.A).

The Commission proposal to extend the WCS rule for protection of MDS/ITFS analog receivers to DARS licensees is not necessary. The DARS licensees have demonstrated in their comments throughout the repeater rulemaking that it is unlikely that repeaters will cause

interference to old MDS/ITFS analog receivers.⁴² MDS/ITFS licensees have been replacing their legacy analog receivers that require protection from operators in adjacent frequency bands with new digital receivers that are less susceptible to interference (and MDS/ITFS licensees have never asserted that newer digital receivers will be susceptible to interference from DARS repeaters).⁴³ Recent coordination discussions between XM Radio and Sprint in Denver support the fact that newly deployed MDS/ITFS base station receivers are equipped with extremely narrow bandwidth notch filters and receivers with extremely high overload threshold points.⁴⁴ MDS/ITFS licensees have had to replace these old analog receivers due to the advent of personal communications services (“PCS”) systems operating in the 1930-1990 MHz band and WCS systems operating in the 2305-2320 MHz and 2345-2360 MHz bands. In addition, the rule for protecting these legacy block downconverters sunsets on February 20, 2002, demonstrating the Commission’s intent that MDS/ITFS licensees would have taken the necessary steps to replace these outdated receivers by now. 47 C.F.R. § 27.58(a)(1).

Regarding the Commission’s prior notice proposals, XM Radio believes a 30-day prior notification requirement is sufficient for both LPRs and HPRs. In fact, the Commission’s rules require WCS licensees to provide MDS/ITFS licensees with only 30-days notice prior to commencing operation of a new WCS station. 47 C.F.R. § 27.58(e). There is no reason to apply a longer notice period to DARS licensees. Thus, XM Radio supports a 30-day prior notice requirement provided the final rule reflects the following: (i) the purpose of the notification

⁴² Consolidated Reply of XM Radio Inc., IB Docket No. 95-91 (March 8, 2000) (“XM March 2000 Comments”); Reply Comments of Sirius Satellite Radio, IB Docket No. 95-91 (March 8, 2000) (“Sirius March 2000 Comments”).

⁴³ XM March 2000 Comments at 8-14; Sirius March 2000 Comments 6-14.

⁴⁴ See Exhibit B (Declaration of Phillip Barsky).

requirement is solely to provide notice and is not to provide MDS/ITFS licensees with an opportunity to file an objection with the Commission prior to the operation of an LPR or HPR; (ii) DARS licensees should be required to provide notice only to those MDS/ITFS licensees that are actually operating facilities for commercial service and, accordingly, MDS/ITFS licensees who want to receive notification prior to the operation of an LPR or HPR should be required to file a certification with the Commission that is served on DARS licensees listing the markets in which they are operating facilities and to update this list periodically; (iii) the Commission should impose a reciprocal obligation on MDS/ITFS licensees and require them to provide DARS licensees with 30-days notice prior to operating a new station; and (iv) allow for a waiver of the 30-day prior notification requirement in unusual cases where an LPR or HPR must be deployed on short notice.

Conclusion

For the aforementioned reasons, XM Radio urges the Commission to act consistently with the views expressed herein.

Respectfully submitted,

XM RADIO INC.

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December 14, 2001

EXHIBIT A

Houston Repeater Coordination Report

This report presents the findings of the SDARS – WCS site coordination activity, which was completed in Houston on October 8, 2001 with participants from the ATTWS technical staff and the XM technical staff. Test results for the WCS base station and the WCS CPE are included.

XM Representatives:

Richard Camden
Shawn S.

XM Member of Technical Staff
ATC Construction Supervisor

ATTWS Representatives:

Russ Kuemper
Patrick Naraine
AT&T site tech.

AT&T Radio Systems Engineer
AT&T Radio Systems Engineer
AT&T site support Technician

The coordination activity focused on the evaluation of potential interference to WCS operations from SDARS high power repeater transmissions in the vicinity of XM's Houston site 015B. Figure 1 below depicts the potential XM SDARS interference zones as modeled by ATTWS for Houston (see ATTWS 21 August, 2001 Submittal).

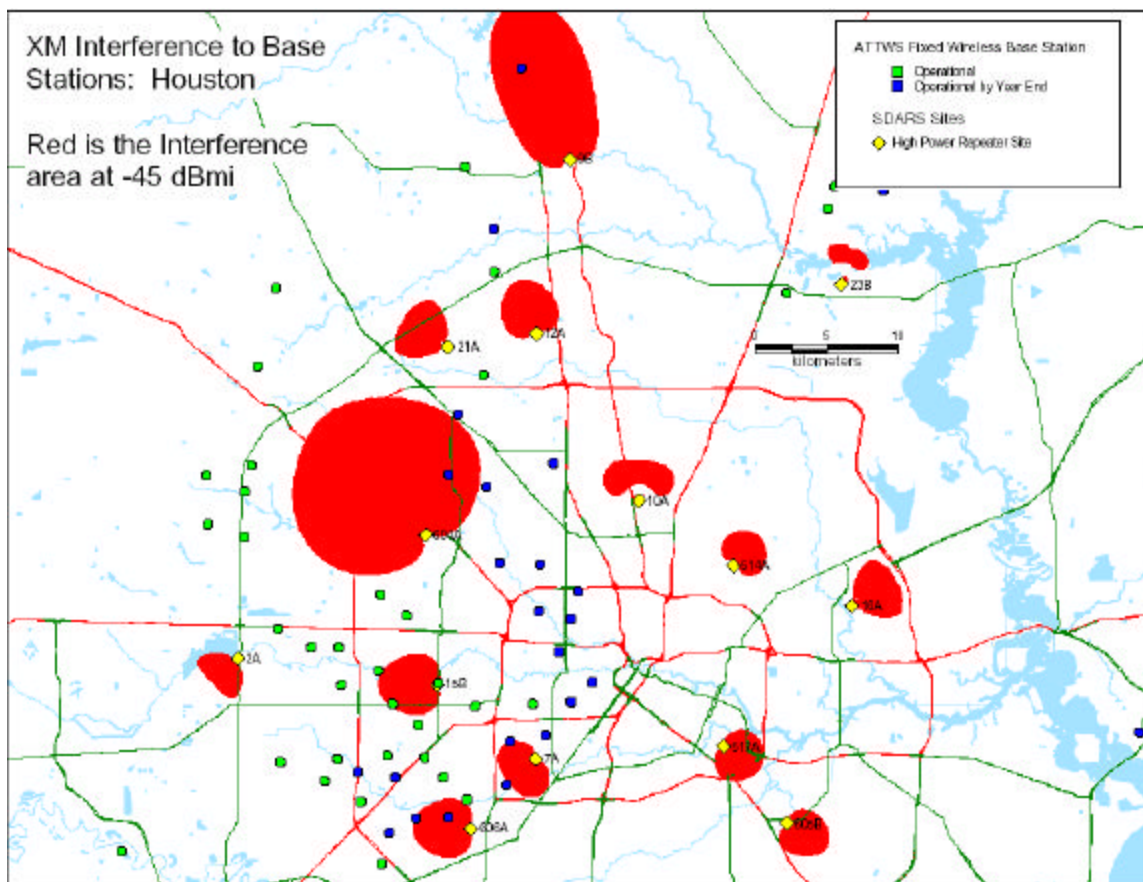


Figure 1. ATTWS Modeled Interference Zones for Houston

Referring to Figure 1, the coordination activity was focused on site15B, where the green operational WCS base station site marker overlaps the yellow high power SDARS repeater site marker. The red zones depict areas where the SDARS repeater signal operating at its rated power of 5110 watts is predicted to be above -45 dBm, which is the base station blanketing interference threshold reported by ATTWS.

The antenna for XM site 15B is positioned on the rooftop of the building located at 7500 San Felipe Drive. The antenna array for the operational ATTWS Base station is positioned on the rooftop of an adjacent building located at 1616 South Voss Road. Figure 2 depicts the site configuration and the approximate bore sight directions of the SDARS repeater and WCS base station panel antennas. From the diagram it easy to see that the ATTWS Base station is almost directly behind the SDARS Repeater.

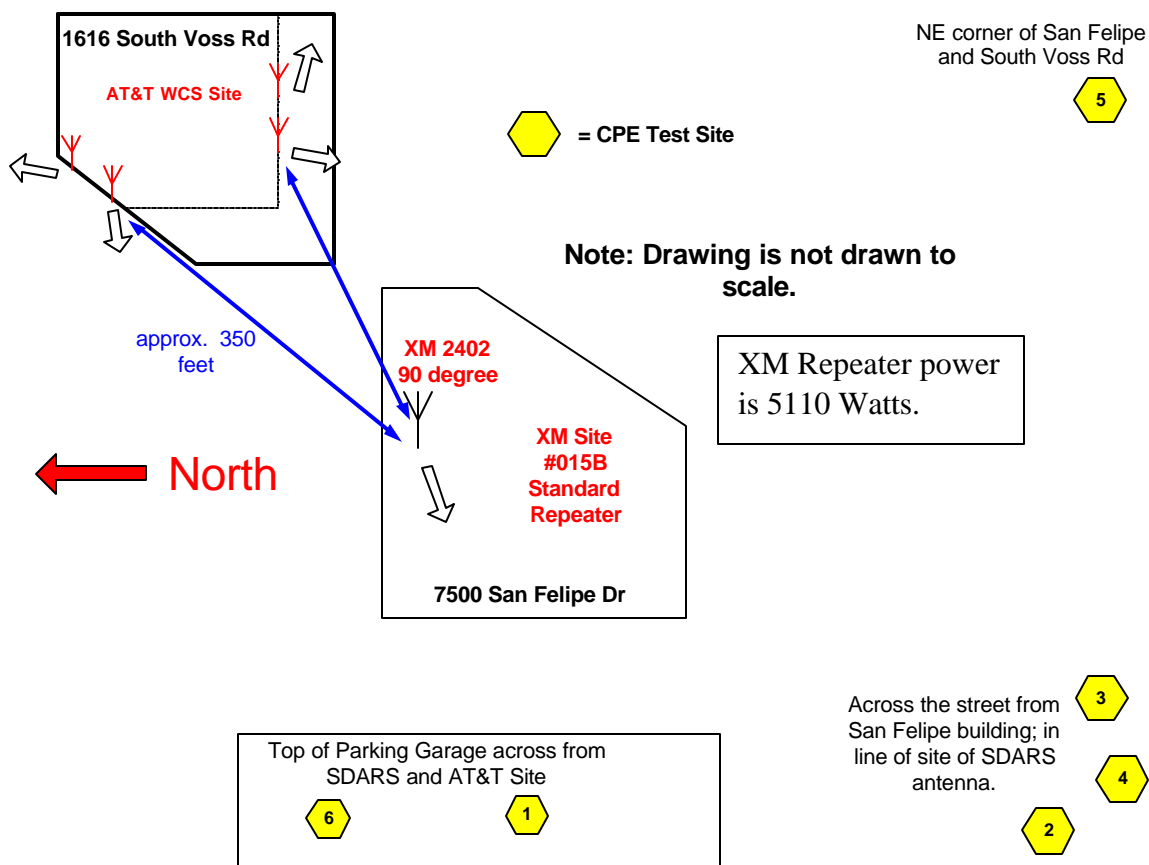


Figure 2. Site Description for XM Repeater Antenna and WCS Base Antennas

The distance between the XM antenna and the closest ATTWS antenna is approximately 350 feet, with the XM antenna pointed away from the ATTWS antennas. The investigation of possible ATTWS CPE (Customer Premise Equipment) interference in the main beam of the SDARS antenna was evaluated with the help of the ATTWS engineers in the 6 locations depicted with yellow markers.



Figure 3. Roof Top Photograph of XM Antenna and ATTWS Antennas



Figure 4. Close Up of ATTWS Sector Antennas

Base Station Tests

Prior to testing, the ATTWS engineers reported to XM that interference had not been detected on any of the subscriber links active with the base station. On-site, the tests were performed at the ATTWS base-station Rx-IF ports for the West and North antenna sectors to determine if interference was detectable at the IF port. Testing was performed with the XM SDARS transmitter at full power (5110 Watts) and with the SDARS transmitter turned off. The ATTWS IF port was monitored before and after the reduction of the XM SDARS RF power. The test results indicated no interference was present at the ATTWS base station.

CPE Tests

After the base-station evaluation was complete, XM and ATTWS engineers proceeded to try and find a location line-of-site to the XM antenna for potential SDARS interference to a CPE unit. The CPE testing configuration consisted of a CPE pole top antenna unit mounted on a pivotal structure to allow 360-degree elevation and azimuth adjustment, as shown in Figure 5. The antenna unit was connected via cable to the receiver unit.



Figure 5. Portable CPE Unit on Elevation and Azimuth Alignment Fixture

A PC was connected to the CPE receiver unit and a diagnostic test mode was used to evaluate the WCS connection. The CPE uses various means to evaluate the signal quality of the link that is

established with the AT&T base-station. A test van was used to mobilize the CPE set up which allowed interference measurements to be conducted in multiple regions of the SDARS antenna main beam.

Six locations were tested in line-of-sight to the SDARS antenna, as indicated in Figure 1. Adjustments were made to the CPE antenna orientation at each location in an attempt to identify potential interference. At each location the XM repeater was cycled on and off. The test results from the six locations indicated the XM site 15B did not cause interference to the CPE communicating with the WCS base station at these locations.

Summary

Joint testing with the ATTWS and XM technical staff in Houston concluded that the high power SDARS repeater does not interfere with WCS Base Station or CPE operations at XM repeater site 15B. The results are especially encouraging in that CPE communications were interference free when operated in close proximity to the SDARS antenna, which indicates the ATTWS CPE may be more robust than previously reported, which was based on equipment specifications.

EXHIBIT B

DECLARATION OF PHILLIP BARSKY

I, Phillip Barsky, do hereby declare and state:

I am the Spectrum Management/Regulatory System Engineer of XM Radio Inc.

My business address is 1500 Eckington Place, NE, Washington, DC 20002.

Lack of Interference to Worldcom, Inc.'s WCS Facilities in Memphis

1. On or about 9/4/01, I was contacted by Mr. Stephen Daugherty of Worldcom, Inc. ("Worldcom") regarding his belief that an XM Radio higher power repeater in Memphis would cause interference to a Worldcom WCS base station collocated with the repeater. Mr. Daugherty's belief was based on a theoretical worst-case analysis using a certain receiver overload sensitivity threshold.

2. Subsequently, Worldcom's engineers did some testing which detected the signal from XM Radio's repeater at its base station but concluded that XM Radio's repeater was not in fact causing any interference to Worldcom's base station.

Lack of Interference to Sprint's MDS Facilities in Denver

3. On 10/17/01, I was contacted by representatives of Sprint to discuss their belief that an XM Radio repeater located in Denver was causing interference to a Sprint MDS facility.

4. I provided the Sprint representatives with further information regarding this repeater site in order to facilitate coordination.

5. With this information, the Sprint representatives concluded that XM Radio's repeater was not in fact causing any interference to Sprint's base station.

6. During the course of my discussions with Sprint, I learned that Sprint is deploying MDS base stations that are extremely resistant to interference. These base stations are equipped with extremely narrow bandwidth notch filters and receivers with extremely high overload threshold points, exceeding +25dbm.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 14, 2001.

/s/Phillip Barsky
Phillip Barsky

CERTIFICATE OF SERVICE

I, David S. Konczal, an attorney with the law firm of Shaw Pittman LLP, hereby certify that on this 14th day of December 2001, I caused copies of the foregoing Comments to be mailed via first-class postage prepaid mail or, where indicated, electronic mail to the following:

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